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Attorney Docket No. 0756-1982

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Shunpei YAMAZAKI

Serial No. 09/327,469

Filed: June 8, 1999

For: SEMICONDUCTOR DEVICE AND
METHOD OF MANUFACTURING
THE SAME

) Group Art Unit: 2814

) Examiner: G. Peralta

) CERTIFICATE OF MAILING

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) Alexandria, VA 22313-1450, on December 10,
) 2004.

) [Signature: Ashli M. Stamps]

RESPONSE

Honorable Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The Official Action mailed August 10, 2004, has been received and its contents carefully noted. Filed concurrently herewith is a *Request for One Month Extension of Time*, which extends the shortened statutory period for response to December 10, 2004. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on June 8, 1999, and August 21, 2001. A further Information Disclosure Statement is submitted herewith and consideration of this Information Disclosure Statement is respectfully requested.

Claims 2-13 and 20-23 are pending in the present application, of which claims 2-6, 8, 20 and 21 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 2 of the Official Action rejects claims 2, 3 and 20-23 as obvious based on the combination of U.S. Patent No. 5,830,784 to Zhang et al., U.S. Patent No. 5,569,610 to Zhang et al. and U.S. Patent No. 5,869,803 to Noguchi et al. The

Applicants respectfully traverse the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. Zhang '784, Zhang '610 and Noguchi, either alone or in combination, do not teach or suggest at least the above-referenced features of the present invention. The Official Action asserts that Zhang '784 discloses, in Figs. 3A to 3D, "patterning the semiconductor film to form at least a first semiconductor island after the irradiation of the laser beam" (page 2, Paper No. 0804). The Applicants respectfully disagree and traverse the above-referenced assertion. It appears that Zhang '784 discloses that the semiconductor film 205 which is crystallized by the heat-annealing treatment is patterned so that a first semiconductor island 208/209/210 is formed as shown in Figs. 3B and 3C. In Fig. 3C, the laser beam is irradiated to the first

semiconductor island 208/209/210 after the patterning. Therefore, the Applicants respectfully submit that Zhang '784 does not teach or suggest patterning a semiconductor film to form at least a first semiconductor island after irradiation of a laser beam.

Zhang '610 and Noguchi do not cure the above-referenced deficiencies in Zhang '784. Zhang '610 and Noguchi are relied upon to allegedly teach holding a catalytic element in contact with an entire surface of a semiconductor film, a laser beam shaped in a rectangle or a square, and an irradiation area of a laser beam (pages 3-4, Paper No. 0804). However, Zhang '784, Zhang '610 and Noguchi, either alone or in combination do not teach or suggest patterning a semiconductor film to form at least a first semiconductor island after irradiation of a laser beam. Since Zhang '784, Zhang '610 and Noguchi do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Also, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Zhang '784, Zhang '610 and Noguchi or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be used together, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The Official Action concedes that Zhang '784 does not teach a laser beam shaped in a rectangle or a square, and an irradiation area of a laser beam (page 3, Paper No. 0804). The Official Action asserts that Noguchi teaches "a method of promoting crystallization of a silicon layer that includes a laser beam shaped as a square or rectangle as shown in Figs. 1 and 2, having an irradiation area of 36 cm² or

more" (page 4, Paper No. 0804). The Official Action asserts that it would have been obvious to one of ordinary skill in the art at the time of invention to combine Zhang '784 and Noguchi because "there is no statement denoting the criticality of the irradiation area" and "Noguchi et al. teaches that the use of this irradiation areas are well known in the art" (page 4, Paper No. 0804). The Applicants respectfully disagree and traverse the above assertions in the Official Action.

Specifically, it is unclear how the alleged lack of criticality of the irradiation area or the alleged well known use of irradiation areas is sufficient to motivate one of ordinary skill in the art to combine Zhang '784 and Noguchi. In the present invention, the third step of irradiating laser light is conducted after a second step of holding a catalytic element. However, it appears that Noguchi discloses that a step of irradiating laser light 215 is conducted after a step of depositing an amorphous silicon layer 213 without any steps therebetween (Figs. 20A-20B and column 18, line 35 to column 19, line 44). It is unclear how or why one of ordinary skill in the art would have been motivated to modify Zhang '784 such that irradiation of laser light is conducted after holding a catalytic element. Therefore, the Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art at the time of the invention to combine Zhang '784 and Noguchi to derive the order of the steps of the Applicants' invention.

In the present application, it is respectfully submitted that the prior art of record, alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.


Paragraph 3 of the Official Action rejects claims 6-13 as obvious based on the combination of Zhang '784, Zhang '610, JP 09-312260 to Otani and Noguchi.

Otani does not cure the deficiencies in Zhang '784, Zhang '610 and Noguchi. The Official Action relies on Otani to allegedly teach a thermal oxidation treatment (page 8, Paper No. 0804). However, Zhang '784, Zhang '610, JP Otani and Noguchi, either alone or in combination, do not teach or suggest patterning a semiconductor film to form at least a first semiconductor island after irradiation of a laser beam. Since Zhang '784, Zhang '610, JP Otani and Noguchi do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Also, Otani does not cure the deficiencies in the alleged motivation to combine Zhang '784 and Noguchi. Otani does not teach or suggest that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Zhang '784 and Noguchi to derive the order of the steps of the Applicants' invention, i.e. that the third step of irradiating laser light is conducted after a second step of holding a catalytic element. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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